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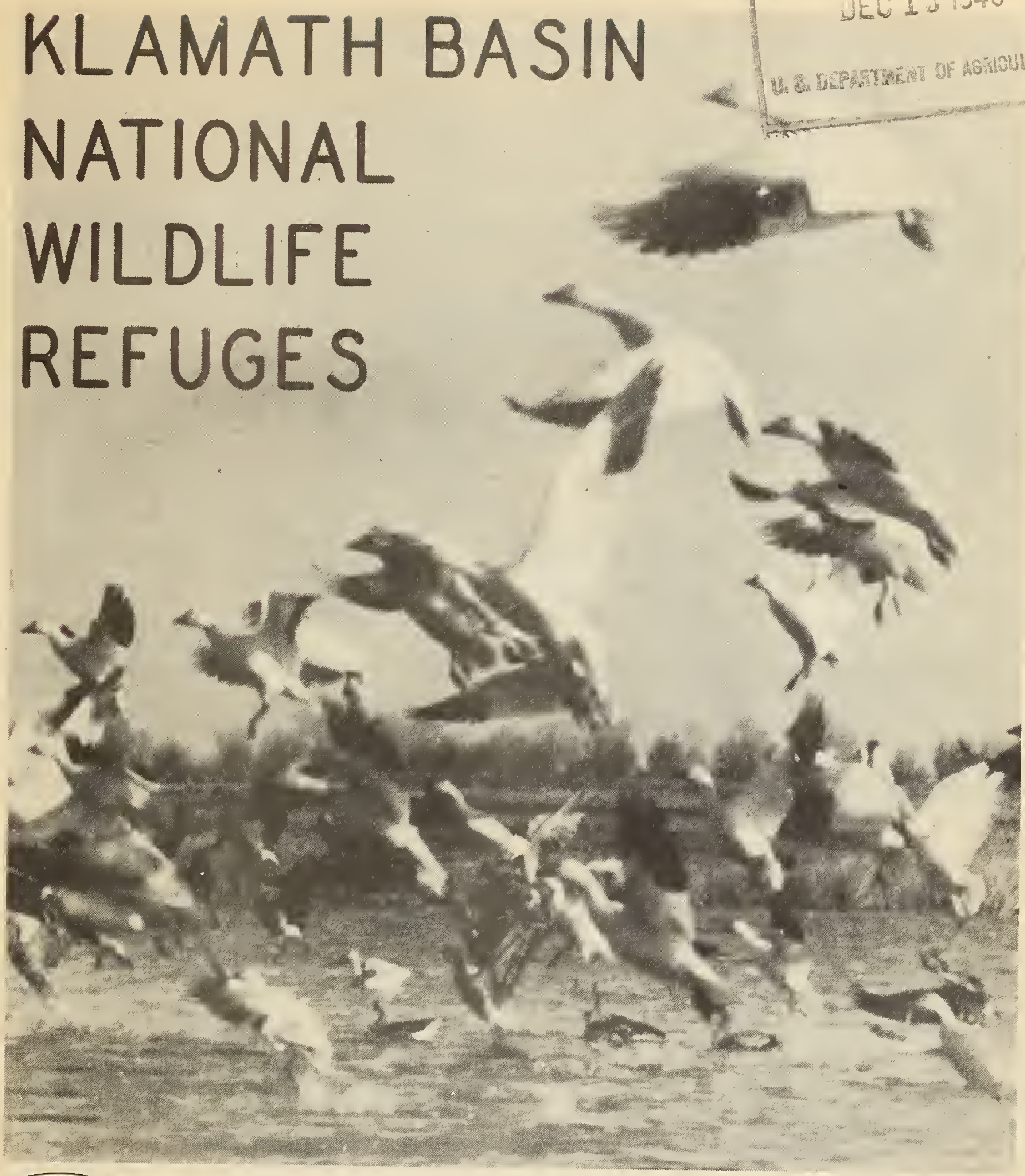

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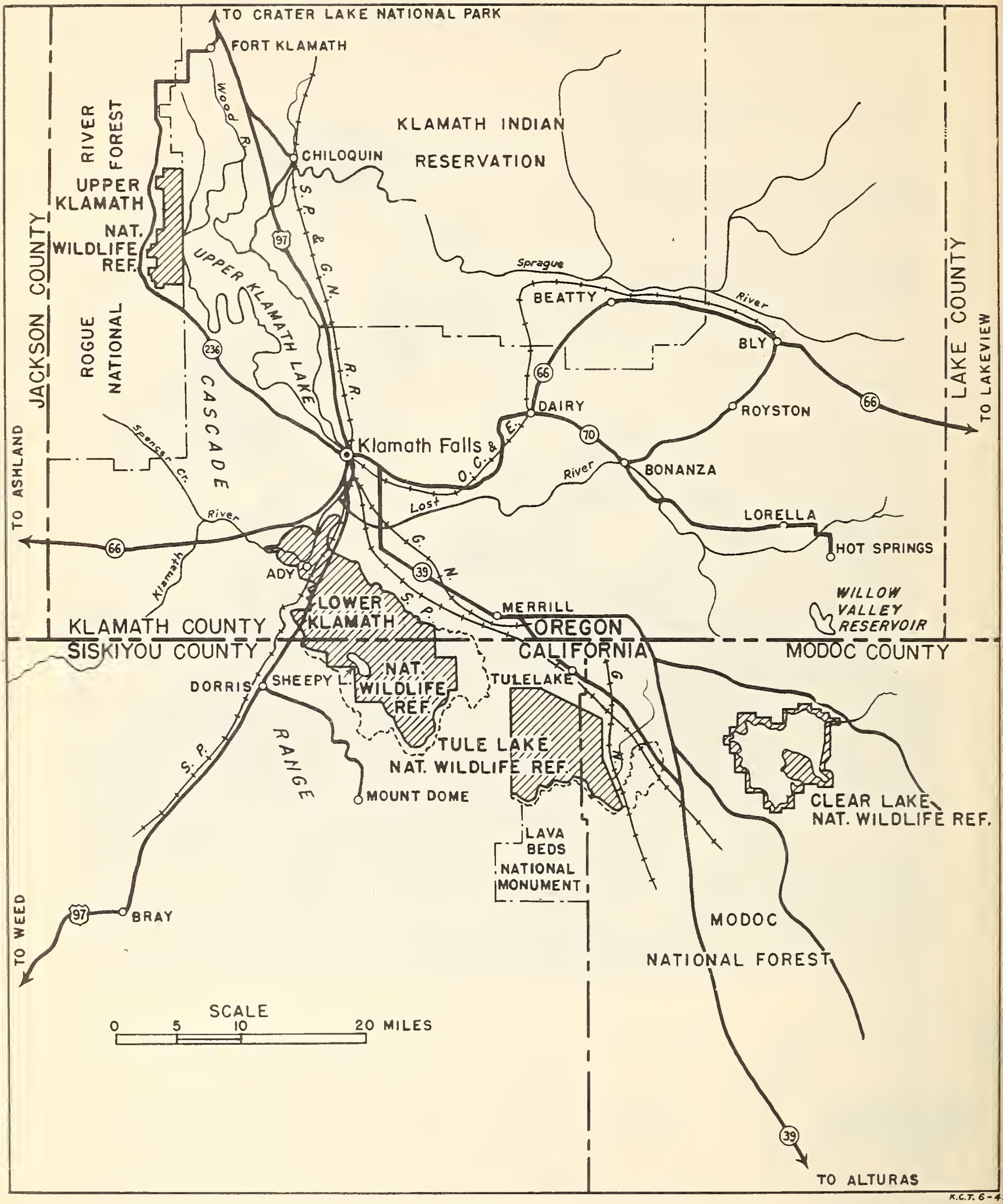

KLAMATH BASIN NATIONAL WILDLIFE REFUGES
OREGON AND CALIFORNIA

United States Department of the Interior
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KLAMATH BASIN NATIONAL WILDLIFE REFUGES
OREGON AND CALIFORNIA

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Since the early days of exploration and settlement, the Klamath Basin of southern Oregon and northern California has been famous for its wildlife. Hardy trappers of the Hudson's Bay Company were attracted by the rich harvest of beaver, otter, and other fine furs. Later the vast marshes teeming with ducks, geese, and swans lured many hunters. In its network of lakes, streams, and swamps this Basin provides one of the most important wildlife nurseries in the Nation. Here hordes of ducks and geese find ideal food, water, and cover and lay their eggs and raise their families under almost primeval conditions; and thousands of grebes, gulls, and terns also, as well as numerous herons, egrets, bitterns, coots, snipes, rails, and other swamp birds, find in it a splendid summer home. The open uplands are well stocked with valley and mountain, or plumed, quails, ruffed and Sierra grouse, sage hens, and introduced ring-necked pheasants and European partridges. An abundant variety of plant life supplies food for the birds and shelter from their natural enemies. On the forested ridges deer are common, and antelopes occasionally wander into the southern refuges of the Basin.

LOCATION AND DESCRIPTION

The Klamath Basin in Klamath County, Oreg., and Siskiyou and Modoc Counties, Calif., is bounded on the north by the Wood River Valley near old Fort Klamath, on the east by the low range of hills east of Upper Klamath Lake, Oreg., and the eastern border of Modoc County, Calif., on the south by the Lava Beds National Monument and the Modoc National Forest, and on the west by the Rouge River National Forest and the Cascade Mountains. It embraces thousands of acres of forested hills and sagebrush plains, and a veritable maze of rivers, creeks, lakes, and swamps fed by the deep snows of the Cascades. Upper Klamath Lake, Oreg., is one of the larger fresh-water lakes of the United States, but Lower Klamath Lake, overlapping the Oregon-California line, has frequently been almost dry owing to a futile effort to utilize its bed for agricultural-crop production. In California, Tule Lake formerly covered about 40,000, and Clear Lake some 30,000 acres. The waters of the entire area are used to some extent for generating hydroelectric power and for irrigation.

HISTORY

The earliest record of the white man's invasion of the Klamath country is that obtained in John C. Frémont's published account of his expedition to Oregon and northern California. 1/ In December 1843 he and his little band of explorers reached the northern part of the Klamath marsh. The season being winter, they made only a brief visit and continued their journey eastward through the more open country to the north.

Soon after Fremont's trip came the vanguard of trappers, who reaped a rich harvest of beaver and other furs. These were followed by the settlers, who began to engage in livestock raising. As the number of ranchers increased, the local Indians, of the Modoc tribe, became more and more hostile toward the white men for taking their lands, and in September 1852 blood was shed. An immigrant train of 65 men, women, and children coming over the old trail between Tule and Upper Klamath Lakes was attacked by Indians led by old Chief Schonchin, who killed outright or horribly tortured to death all but two girls, 12 and 14 years old. This Bloody Point massacre was never forgotten, and the white settlers determined on revenge. Ben Wright, an influential young Californian, led a body of soldiers in pursuit, but the Indians eluded them until invited to a conference under a white flag of truce. An elaborate meal was prepared at which Wright tried to poison all his Indian guests, but failing in this, he and his companions shot down 41 of the 46. Numberless outrages on the part of both Whites and Indians followed until under a treaty with the Federal Government the Modocs agreed to settle on the Klamath Indian Reservation north of Upper Klamath Lake. This treaty was not ratified until 1869, and in the meantime, because of growing trouble between the Modocs and the much more powerful

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1/ Frémont, John Charles. Report of the exploring expedition to the Rocky Mountains in the year 1842 and to Oregon and North California in the years 1843-44. House Ex. Doc. 166, 28th Cong., 2d Sess., 583 p., 1845.

Klamath Indians, Kientpoos of the Modocs, or Captain Jack as he was better known, took a small number of his followers back to their ancestral home on Lost River and the lava beds at Tule Lake. His disorderly band of Modocs frightened although they did not actually attack white women and children, but the alarmed settlers complained to military officers at Fort Klamath.

On November 28, 1872, Captain James Jackson with 40 troopers left Fort Klamath and arrived early the next morning at Captain Jack's camp on Lost River to arrest him and his followers and return them to the reservation. During the fight that ensued Captain Jack and his Indians escaped, fleeing with their women and children to the almost impenetrable lava beds, and the soldiers returned to Fort Klamath. More troops were then mustered, and a war that in some ways is unparalleled in American history was undertaken to wipe out this band of 50 Indian outlaws. To kill or capture them, a force of 400 trained men marched to the lava beds, but they had failed to take into consideration the topography of the country and the cunning of the Indians. The first period of the war was characterized by small skirmishes and little progress. Some idea of how the soldiers were handicapped may be gained from the following description of the lava beds by Captain G. J. Lydecker, of the United States Engineers, who surveyed and mapped the Tule Lake area:[2]

> "They present the appearance on first sight of an immense sagebrush plain with no obstruction to easy movement in every direction. A closer examination, however, develops the fact that the plain is broken at irregular intervals by sections of low rocky ridges. The ridges are not isolated, but occur in groups and form a perfect network of obstruction admirably adapted to a defense by an active enemy; they seldom rise to a height of 10 feet above the bed and are, as a rule, split open at the top giving this continuous cover along their crests."

The first determined effort to dislodge the Indians was made on January 17, 1873, when the soldiers entered the lava beds and searched all day, but saw scarcely a Modoc. From the most unexpected places, however, would come a spit of fire followed by the crack of a rifle, some soldier usually receiving the bullet. As evening came the soldiers withdrew to their camp on the shore of Tule Lake. Nine had been killed and thirty wounded but not an Indian had been touched. Colonel Frank Wheaton, then in command, asked for 1,000 soldiers to carry on. He was succeeded by Colonel A. C. Gillen, who was reinforced until he had 1,000 soldiers on the ground. General Edward S. Canby then took active command and also acted as advisor to a newly created Peace Commission. This Commission finally succeeded in getting Captain Jack and five of his warriors to meet under a flag of truce with its members on April 11 to discuss peace terms, but the Indians attending the conference came with weapons concealed under their clothes and brutally murdered four members of the Commission and wounded the fifth.

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[2] Lydecker, G. J. Extract from report accompanying maps and drawings of May 24, 1873, forwarded to the Secretary of War and published in the Daily Graphic (New York), Monday, June 14, 1873.

Many battles similar to that of January 17 were fought, the Indians having all the advantage. On the day of the peace conference a band of 20 Modocs attacked 85 officers and soldiers as they sat eating their lunch in an open spot in the lava beds and killed 22, including every officer, and wounded 18. Not an Indian was hurt.

Only when the Federal forces later brought up several cannons did the Modocs finally abandon their position and withdraw under cover of darkness. The soldiers immediately took up their trail, and on June 1 Captain Jack, tired and hungry, was captured in Willow Creek Canyon.

The end came on October 3, 1873, when Captain Jack and three of his companions were hanged at Fort Klamath. Remains of the old scaffold were still visible at the time the Upper Klamath National Wildlife Refuge was established. During the campaign about 1,200 Federal soldiers were detailed to put down 50 Modoc warriors. The United States loss was 168 dead or wounded, while the Indian loss was 12 killed, 4 hanged, and 1 suicide. The Modoc Indian War cost the Government about $500,000, or $10,000 for each Indian killed or captured, and has been called the most expensive war in proportion to its objectives in which the United States was ever engaged.

NATIONAL WILDLIFE REFUGES ESTABLISHED

In the Klamath Basin, an important waterfowl breeding ground, four national wildlife refuges have been established: Upper Klamath, Oreg.; Lower Klamath, Oreg. and Calif.; and Tule Lake and Clear Lake, Calif.

Upper Klamath Refuge

The Upper Klamath National Wildlife Refuge, comprising 8,140 acres of swamp and open water along the northwestern side of Upper Klamath Lake, Oreg., was established by Executive Order No. 4851, of April 3, 1928, as a nesting and feeding ground for waterfowl. At an elevation of slightly above 4,000 feet, it lies in the very shadow of the forested east base of the Cascade Mountains and is well watered by mountain streams and deep, clear springs.

In summer, mallards, pintails, cinnamon teals, wood ducks, Canada geese, sora and Virginia rails, bitterns, coots, grebes, and many other birds congregate here. On Thomas Creek is a rookery of several hundred nests of Farallon cormorants, blue herons, black-crowned night herons, and the beautiful, snow-white American egrets.

Along the western boundary of the refuge the Western Humid, or Coastal, Belt meets the arid Great Basin. There the trees are characterized by mixed growths of Douglas fir, yellow pine, juniper, and aspen, and there may be found the dark Sierra grouse and a ruffed grouse (which in coloration is between the coast race and the Rocky Mountain race but typical of neither), and the red-breasted and the red-naped sapsuckers.

Upper Klamath Lake is on the dividing line between the ranges of two subspecies of deer, the mule deer on the east and the Columbian blacktail on the west.

The best time to visit the Upper Klamath Refuge is in summer. Warm, clear days and cool nights are the rule from April to October. During the remainder of the year the land and water may be locked in the frigid grip of winter, when snow closes the roads and ice prevents travel by water.

Lower Klamath Refuge

Lower Klamath National Wildlife Refuge, containing 81,619 acres, partly in Klamath County, Oreg., and partly in Siskiyou County, Calif., was established by Executive Order No. 924, of August 8, 1908. This was among the first of the important waterfowl reservations placed under the supervision of the Biological Survey, now the Fish and Wildlife Service, and was originally the greatest nursery for ducks, geese, and marsh birds in the Western States. Here was a vast shallow lake of more than 81,000 acres, with miles of tule-bordered shore line, hundreds of small tule-covered islands, and hundreds of acres of food-producing swamps.

At the time the area was made a refuge, in 1908, literally clouds of birds of many species darkened the sky; the thunder of their wings was like the roar of distant surf, and their voices drowned out all other sounds. These vast summer flocks, moreover, were greatly increased each fall when the legions of ducks, geese, swans, and cranes from northern nesting grounds stopped on their journey to their winter homes in the valleys of California, and again in spring on their return northward. It was during the nesting season in early summer that the birds could be seen and studied at their best.

It was on Lower Klamath Lake that market hunters had carried on their slaughter of ducks and geese by the wagonload for city markets, and that plume hunters had ruthlessly killed equally large numbers of terns, grebes, and other birds unfortunate enough to possess plumage desired by the millinery trade. The lake also was the mecca for fur trappers, who gathered a rich harvest of mink, otter, and other fine furs each winter. There, too, early ornithologists eager to learn more about the birds of the West found an outdoor laboratory worthy of their most studious efforts.

Prior to 1916 the waters of the lake were deep enough for fair-sized power boats, and boating trips were commonly made by visitors from the city of Klamath Falls down the Klamath River and directly into Lower Klamath Lake to see the vast colonies of western and eared grebes or the pelicans, herons, gulls, and terns that nested there by the tens of thousands. There, too, various ducks common to the Northern States, and, in addition, many Canada geese, nested and raised their young.

All this has changed, however, owing to the ever-increasing demand for agricultural lands. A gate was built across the channel leading from Klamath River into Lower Klamath Lake, thus preventing the water from flowing into the lake. Within 4 years this vast waterfowl paradise had dried up. Because of the dryness, peat fires started, which in many places burned to a depth of 6 feet or more, leaving nothing but a vast alkaline, ashy desert from which clouds of choking dust arose, often obscuring the sun. Efforts were made to cultivate part of this lake bed, but in most of the area they were total failures.

The drying up of Lower Klamath Lake not only ruined a great waterfowl nesting area, but owing to the lowering of the water table rendered worthless a number of large livestock ranches along its shores. Work is now in progress on a plan to reflood a large part of the area and thus restore it to its original occupants, the migratory waterfowl.

Tule Lake Refuge

Tule Lake National Wildlife Refuge, Calif., just below the Oregon line, lies in the former bed of Tule Lake, which was reclaimed for agriculture by diverting the greater part of the waters of Lost River from the lake and thus causing it to dry up. Much of the area adjacent to the refuge has now become highly developed and profitable farming lands. The refuge was established by Executive Order No. 4975, of October 4, 1928, when slightly more than 11,000 acres covered by surplus irrigation water were set aside as a haven for waterfowl. Subsequent Executive orders of 1932 and 1936 enlarged the refuge to 37,340 acres, which include practically all the lands that are being farmed under lease in the old lake-bed area.

The first development on the refuge was the building of a dike from the site of the refuge headquarters on the west to the Great Northern Railway grade and tracks on the east, thus cutting off the southern half of the old lake bed. Additional dikes and spillways were later constructed to control water levels in the entire basin. Thirty nesting islands for birds also were built, each measuring about 300 feet long by 40 feet wide and projecting about 3 feet above the water line. Some of these were covered with coarse gravel and rocks to make them attractive to cormorants, pelicans, and gulls, and others were planted to tules or grasses to furnish cover for the nests of ducks and geese.

Pheasants, quail, and other upland game birds are protected from winter storms by shelters constructed of sagebrush tightly thatched on a framework of posts and cross poles, the interiors being loosely filled with willows, which allow free use by the birds but interfere with the entrance of most predators. At each shelter is a food hopper of 2-bushel capacity in which barley or wheat is placed during periods when other food is covered with snow or ice. Upland birds are quick to make use of these feeding stations, being known to visit a new one in the evening of the day it is completed. These shelters serve to decrease materially the winter kill by predators.

Clear Lake Refuge

Clear Lake National Wildlife Refuge, containing 25,300 acres, comprises all the irrigation storage basin in Modoc County, Calif. The surrounding country is a great sagebrush plain, dotted with junipers in which at a few moist spots small groups of willows grow. This wildfowl refuge was established by Executive Order No. 1332, of April 11, 1911.

The refuge is notable for the abundance of Canada geese that nest along the shores of the lake and for the great colony of white pelicans that nearly covers two small rocky islands in the lake. Mallards, pintails, gadwalls, cinnamon teals, redheads, and other important species of ducks nest and raise their young along the lake shore. Great colonies of California gulls and Caspian terns breed on some of the rocky islands, and Forster's terns nest by hundreds on some that are low and grassy. A few pairs of Farallon cormorants and Treganza's blue herons build their nests on greasewood bushes on the island retreats of the pelicans, and many western willets hide theirs on the saltgrass flats along the shore. Sage thrashers and Brewer's sparrows sing from the sage tops on the dry uplands.

During fall and spring migrations the local bird populations are greatly increased by white-fronted, snow, and cackling geese and many species of northern-reared ducks that enjoy the protection afforded and the abundant natural food available on this great refuge.

LIFE ZONES

In the Klamath Basin wildlife refuges in California and Oregon three life zones are represented: Canadian, Transition, and the Upper Sonoran, or western division of Upper Austral. Some of the mammals, birds, and plants that occur in these zones on the refuges are here mentioned in order to convey a clearer idea of their distribution. They are not necessarily the species that characterize the zones in other parts of the continent.

The Canadian, the highest and coldest zone in the area, occurs only in a narrow belt in the northwestern part of the Upper Klamath Refuge near Recreation Post Office. Among the plants found there are the aspen

(*Populus tremuloides*) of large size in beautiful groves, white fir (*Abies concolor*), and red fir (*A. magnifica*), mixed with Douglas fir (*Pseudotsuga taxifolia*), and on the more open slopes several beautiful species of pentstemons, asters, paintbrushes (*Castilleja*), blue lupines, and other flowering plants that add color to the landscape. During summer the wet meadows are natural flower gardens. There the yellow monkeyflower (*Mimulus*) and the monkshood (*Aconitum columbianum*) bloom in profusion, and the green rush (*Juncus regelii*) and bulrushes, or tules (*Scirpus*), line the lake shore.

Birds that may be seen in the Canadian zone of the refuge include an abundance of nesting mallards, the less common Barrow's goldeneye, western goshawk, spotted sandpiper, calliope hummingbird, red-naped sapsucker, western pileated and Arctic three-toed woodpeckers, olive-sided flycatcher, gray jay, Sierra creeper, Sierra hermit thrush, and western ruby-crowned kinglet.

Among the mammals are the snowshoe hare, Cascade squirrel, yellow-bellied marmot, and silver-haired bat.

The Transition Zone includes most of the territory along the western side of Upper Klamath Lake and a narrow strip extending about half the distance between Klamath Falls and Modoc Point along the eastern shore. In that area are found yellow pine (*Pinus ponderosa*) and western juniper (*Juniperus occidentalis*) in the forested part, and some sagebrush (*Artemisia tridentata*), willow (*Salix*), and serviceberry (*Amelanchier florida*) in the more open country. Beds of creeping hollygrape (*Berberis repens*), squaw mat (*Ceanothus prostratus*), and snowbrush (*C. velutinus*) are common in the yellow pine forests, while thickets of lodgepole pine (*Pinus contorta murrayana*) occur at the borders of the Canadian and Transition Zones north of Upper Klamath Lake. On the rolling sagebrush hills flowers grow in abundance. Delphiniums, mallows, and eriogonums make bright spots of blue, red, and yellow among the gray sage. In the marshes, sedges, tules, and pondweeds flourish.

Common birds of this zone on the refuge are the pied-billed grebe, Cooper's hawk, marsh hawk, osprey, Sierra grouse, mountain, or plumed, quail, black-eared nuthatch, western house wren, western robin, Macgillivray's warbler, western tanager, California purple finch, green-tailed towhee, and western chipping sparrow.

Of mammals the most common are the Klamath chipmunk, golden-mantled ground squirrel, Shasta beaver, Rocky Mountain cougar, Columbian black-tailed deer, western mink, Great Basin skunk, and Bendire's shrew.

The Upper Sonoran division of the Upper Austral Zone is the lowest and warmest zone in the Klamath Basin. It comprises all the area around Lower Klamath and Tule Lakes and most of that around Clear Lake. The dominant growth is the sagebrush. Among other plants found there are rabbitbrush (*Chrysothamus*), desert gooseberry (*Ribes velutinum*), flowering phlox, pentstemon, mallow, eriogonum or desert snowvall, wild onion (*Allium douglasii*) and, among the grasses, western fescue (*Festuca occidentalis*), ryegrass (*Elymus arenarius*), and bluegrass (*Poa*). In and adjacent to water areas many species of aquatic plants are abundant, including sedges (*Carex*), tules or bulrushes (*Scirpus americanus nevadensis* and *S. occidentalis*), coontail (*Ceratophyllum*), pondweed (*Potamogeton*), smartweed (*Polygonum*), wigeongrass (*Ruppia*), duckweed (*Lemna*), cattail (*Typha*), and many others that produce food and cover for ducks, geese, and many species of marsh birds.

Common birds of the Upper Austral Zone include the eared grebe, western grebe, white pelican, Farallon cormorant, Anthony's green heron, cinnamon teal and several other ducks of the lower lake region, black-necked stilt, and avocet; on the dry sage-covered plains are found the prairie falcon, sage hen, valley quail, barn owl, Arkansas kingbird, Say's phoebe, California shrike, Brewer's blackbird, dusky horned lark, common house finch, western lark sparrow, and Brewer's sparrow.

Among the mammals that occur in the zone here are the California jack rabbit, Oregon cottontail, bushy-tailed woodrat, Gambel's deer mouse, harvest mouse, Peale's meadow mouse, muskrat (introduced) California kangaroo rat, pocket mouse, coyote, California badger, striped skunk, Tejon bat, and the prong-horned antelope.

INTERESTING FEATURES

A visit to the Klamath Basin wildlife refuges is an experience that will long be remembered. The ornithologist, bird lover, botanist, geologist, photographer, or historian will find much of interest there.

The ornithologist or bird lover may visit the great nesting colonies of egrets, herons, and cormorants along Thomas Creek on the Upper Klamath Lake refuge, or observe the thousands of white pelicans at Clear Lake and the great numbers of Forster's terns, gulls, grebes, and avocets at any of these refuges. Early in spring he may see a mother goose with her golden downy young, or later in summer, the thousands of mother ducks with their varicolored fluffy ducklings. He may go boating on the broad expanse of Upper Klamath Lake and watch the bald eagle, the osprey, or flocks of white pelicans soaring against a sky of deepest blue.

In fall, legions of ducks and geese arrive in great flights from their northern nesting grounds--pintails, mallards, ringnecks, scaups, canvas-backs, redheads, green-winged teals, ruddies, and goldeneyes. Long lines of magnificent snow-white whistling swans wheel in from the long journey from their summer home on the remote Arctic tundras. Perhaps the greatest sight is the vast hordes of geese--the lesser snow geese in beautiful white, with black wing tips, the white-fronted geese with their squawky voices, and the ever-chattering cackling geese. Here, too, may be seen the lesser Canada geese in goodly numbers, and possibly an occasional small flock of diminutive Ross's geese, which resemble the snow geese except in size and are en route from the Arctic to winter homes in the central valleys of California. Even the rare Emperor goose occasionally wanders to the refuge from Alaska. Among this great concentration of northern visitors the stately Canada geese which rear their young on the refuges feed contentedly with the others.

One may go out at daybreak and watch thousands of geese and ducks rise from their feeding grounds with a sound like the roar of a moving train, when mile-long flights of mallards and pintails streak the sky at sunrise, or, during warm spring days, one may sit at dawn concealed in some swampy nook and enjoy the multitude of bird movements and sounds.

The botanist will find that here nature is lavish with her flora. Flowering plants are to be found in great variety throughout the whole Basin. Desert herbs and shrubs abound in the Clear Lake section; the vast marshes rival those of the tropics with their jungles of aquatic vegetation; and in the lowlands are groves of aspens with their soft cool fragrance. On the western side of the Basin, along the road between Klamath Falls and Fort Klamath, are forests of majestic firs, pines, and spruces.

The recent lava formations at Tule Lake and in the adjacent Lava Beds National Monument will attract the geologist. Giant mounds of volcanic cinder may be seen there, and great caves invite the explorer.

The interested historian may examine Klamath marsh, where Captain Fremont made friends with the Indians during the winter of 1844, and the circular banks of earth that surrounded the tepees of the Indian village. He may visit the peninsula at Tule Lake and observe the ancient writings carved in solid rock, or the site of old Fort Klamath, in which were quartered the soldiers who fought the memorable Modoc Indian War at the south end of Tule Lake, in that maze of tumbled lava that aided the Indians so long to defy the white men.

LIST OF BIRDS

The Klamath Basin, with its diversity of conditions--open lakes, great swamps, grassy meadows, coniferous and deciduous forests, and dry deserts--attracts birds of a wide variety of species. All those that have been recorded as occurring in the Klamath Basin section are here listed. Some are of regular and common occurrence, some are winter visitants, and others are only casual.

Lesser loon	Garvia immer elasson.
Holboell's grebe	Colymbus grisegena holboelli.
Eared grebe	Colymbus nigricollis californicus.
Western grebe	Aechmophorus occidentalis.
Pied-billed grebe	Podilymbus podiceps podiceps.
White pelican	Pelecanus erythrorhynochos.
Farallon cormorant	Phalacrocorax auritus albociliatus.
Treganza's blue heron	Ardea herodias treganzai.
American egret	Casmerodius albus egretta.
Brewster's egret	Egretta thula brewsteri.
Anthony's green heron	Butorides virescens anthonyi.
Black-crowned night heron	Nycticorax nycticorax hoactli.
American bittern	Botaurus lentiginosus.
Western least bittern	Ixobrychus exilis hesperis.
White-faced glossy ibis	Plegadis guarauna.
Whistling swan	Cygnus columbianus.
Common Canada goose	Branta canadensis canadensis.
Lesser Canada goose	Branta canadensis leucopareia.
Cackling goose	Branta canadensis minima.
Black brant	Branta nigricans.
Emperor goose	Philacte canagica.
White-fronted goose	Anser albifrons albifrons.
Lesser snow goose	Chen hyperborea hyperborea.
Ross's goose	Chen rossi.
Common mallard	Anas platyrhyncha platyrhyncha.
Gadwall	Chaulelasmus streperus.
Baldpate	Mareca americana.
American pintail	Dafila acuta tzitzihoa.
Green-winged teal	Nettion carolinense.
Blue-winged teal	Querquedula discors.
Cinnamon teal	Querquedula cyanoptera.
Shoveller	Spatula clypeata.
Wood duck	Aix sponsa.
Redhead	Nyroca americana.
Ring-necked duck	Nyroca collaris.
Canvas-back	Nyroca valisineria.
Greater scaup duck	Nyroca marila.
Lesser scaup duck	Nyroca affinis.
American golden-eye	Glaucionetta clangula americana.
Barrow's golden-eye	Glaucionetta islandica.
Bufflehead	Charitonetta albeola.

White-winged scoter	Melanitta daglandi.
Ruddy duck	Erismatura jamaicensis rubida.
Hooded merganser	Lophodytes cucullatus.
American merganser	Mergus merganser americanus.
Western turkey vulture	Cathartes aura teter.
Western goshawk	Astur atricapillus striatulus.
Sharp-shinned hawk	Accipiter velox velox.
Cooper's hawk	Accipiter cooperi.
Western red-tailed hawk	Buteo jamaicensis calurus.
Swainson's hawk	Buteo swainsoni.
American rough-legged hawk	Buteo lagopus sancti-johannis.
Ferruginous rough-legged hawk	Buteo regalis.
Golden eagle	Aquila chrysaetos canadensis.
Northern bald eagle	Haliaeetus leuoocephalus washingtoniensis.
Marsh hawk	Circus hudsonius.
Osprey	Pandion haliaetus carolinensis.
Prairie falcon	Falco mexicanus.
Duck hawk	Falco peregrinus anatum.
Black pigeon hawk	Falco columbarius suckleyi.
Western pigeon hawk	Falco columbarius bendirei.
Eastern sparrow hawk	Falco sparverius sparverius.
Sierra grouse	Dendragapus fuliginosus sierrae.
Oregon ruffed grouse	Bonasa umbellus umbelloides.
Sage hen	Centrocercus urophasianus.
European partridge	Perdix perdix perdix.
Valley quail	Lophortyx californica vallicola.
Plumed quail	Oreortyx picta picta.
Ring-necked pheasant	Phasianus colchicus torquatus.
Sandhill crane	Grus canadensis tabida.
Virginia rail	Rallus limicola pacificus.
Sora	Porzana carolina.
American coot	Fulica americana americana.
Western snowy plover	Charadrius nivosus nivosus.
Killdeer	Oxyechus vociferus vociferus.
Wilson's snipe	Capella delicata.
Long-billed curlew	Numenius americanus americanus.
Upland plover	Bartramia longicauda.
Spotted sandpiper	Actitis macularia.
Western solitary sandpiper	Tringa solitaria cinnamomea.
Western willet	Catoptrophorus semipalmatus inornatus.
Greater yellow-legs	Totanus melanoleucus.
Lesser yellow-legs	Totanus flavipes.
Pectoral sandpiper	Pisobia melanota.
Least sandpiper	Pisobia minutilla.
Red-backed sandpiper	Pelidna alpina sakhalina.
Long-billed dowitcher	Limnodromus griseus scolopaceus.
Western sandpiper	Ereunetes mauri

Marbled godwit	Limosa fedoa.
Avocet	Recurvirostra americana.
Black-necked stilt	Himantopus mexicanus.
Wilson's phalarope	Steganopus tricolor.
Northern phalarope	Lobipes lobatus.
California gull	Larus californicus.
Ring-necked gull	Larus delawarensis.
Bonaparte's gull	Larus philadelphia.
Forster's tern	Sterna forsteri forsteri.
Caspian tern	Hydroprogne caspia imperator.
Black tern	Chlidonias nigra surinamensis.
Western mourning dove	Zenaidura macroura marginella.
Barn owl	Tyto alba pratincola.
Screech owl	Otus asio (subsp.?)
Pacific horned owl	Bubo virginianus pacificus.
Snowy owl	Nyctea nyctea.
California pygmy owl	Glaucidium gnoma californicum.
Western burrowing owl	Spectyto cunicularia hypugaea.
Long-eared owl	Asio wilsonianus.
Short-eared owl	Asio flammeus flammeus.
Richardson's owl	Cryptoglaux funerea richardsoni.
Saw-whet owl	Cryptoglaux acadica acadica.
Nuttall's poor-will	Phalaenoptilus nuttalli nuttalli.
Pacific nighthawk	Chordeiles minor hesperis.
Vaux's swift	Chaetura vauxi.
Rufous hummingbird	Selasphorus rufus.
Calliope hummingbird	Stellula calliope.
Western belted kingfisher	Megaceryle alcyon caurina.
Red-shafted flicker	Colaptes cafer collaris.
Western pileated woodpecker	Ceophloeus pileatus picinus.
Lewis's woodpecker	Asyndesmus lewis.
Red-naped sapsucker	Sphyrapicus varius muchalis.
Southern red-breasted sapsucker	Sphyrapicus varius daggetti.
Williamson's sapsucker	Sphyrapicus thyroideus thyroideus.
Modoc woodpecker	Dryobates villosus orius.
Batchelder's woodpecker	Dryobates pubescens leucurus.
Northern white-headed woodpecker	Dryobates albolarvatus albolarvatus.
Arctic three-toed woodpecker	Picoides arcticus.
Arkansas kingbird	Tyrannus verticalis.
Ash-throated flycatcher	Myiarchus cinerascens cinerascens.
Say's phoebe	Sayornis sayus sayus.
Little flycatcher	Empidonax trailli brewsteri.
Hammond's flycatcher	Empidonax hammondi.
Wright's flycatcher	Empidonax wrighti.
Gray flycatcher	Empidonax griseus.
Western wood pewee	Myiochanes richardsoni richardsoni.
Olive-sided flycatcher	Nuttallornis borealis borealis.
Dusky horned lark	Otocoris alpestris merrilli.
Violet-green swallow	Tachycineta thalassina lepida.
Tree swallow	Iridoprocne bicolor.

Bank swallow	Riparia riparia riparia.
Rough-winged swallow	Stelgidopteryx ruficollis serripennis.
Barn swallow	Hirundo rustica erythrogastra.
Northern cliff swallow	Petrochelidon albifrons albifrons.
Western martin	Progna subis subis.
Gray jay	Perisoreus obscurus griseus.
Blue-fronted jay	Cyanocitta stelleri frontalis.
Long-tailed jay	Aphelocoma californica immanis.
American magpie	Pica pica hudsonia.
American raven	Corvus corax sinuatus.
Western crow	Corvus brachyrhynchos hesperis.
Pinon jay.	Cyanocephalus cyanocephalus.
Clark's nutcracker	Nucifraga columbiana.
Grinnell's chickadee	Penthestes gambeli grinnelli.
Chestnut-backed chickadee	Penthestes rufescens rufescens.
California bush tit	Psaltriparus minimus californicus.
Slender-billed nuthatch	Sitta carolinensis aculeata.
Red-breasted nuthatch	Sitta canadensis.
Black-eared nuthatch	Sitta pygmaea melanotis.
Sierra creeper	Certhia familiaris zelotes.
Pallid wren tit	Chamaea fasciata henshawl.
Dipper	Cinclus mexicanus unicolor.
Western house wren	Troglodytes aedon parkmani.
Western winter wren	Nannus hiemalis pacificus.
San Joaquin wren	Thryomanes bewicki drymoecus.
Western marsh wren	Telmatodytes palustris plesius.
Dotted wren	Catherpes mexicanus punctulatus.
Common rock wren	Salpinctes obsoletus obsoletus.
Sage thrasher	Oreoscoptes montanus.
Western robin	Turdus migratorius propinquus.
Pacific varied thrush	Ixoreus naevius naevius.
Sierra hermit thrush	Hylocichla guttata sequoiensis.
Western bluebird	Sialia mexicana occidentalis.
Mountain bluebird	Sialia currucoides.
Townsend's solitaire	Myadestes townsendi.
Western golden-crowned kinglet	Regulus satrapa olivaceus.
Western ruby-crowned kinglet	Corthylio calendula cineraceus.
American pipit	Anthus spinoletta rubescens.
Cedar waxwing	Bombycilla cedrorum.
Northwestern shrike	Lanius borealis invictus.
California shrike	Lanius ludovicianus gambeli.
Starling	Sturnus vulgaris vulgaris.
Hutton's vireo	Vireo huttoni huttoni.
Cassin's vireo	Vireo solitarius cassini.
Western warbling vireo	Vireo gilvus swainsoni.
Lutescent warbler	Vermivora celata lutescens.
Calaveras warbler	Vermivora ruficapilla gutturalis.
California yellow warbler	Dendroica aestiva brewsteri.
Audubon's warbler	Dendroica auduboni auduboni.

Black-throated gray warbler	Dendroica nigrescens nigrescens.
Townsend's warbler	Dendroica townsendi.
Hermit warbler	Dendroica occidentalis.
Macgillivray's warbler	Oporornis tolmiei.
Western yellow-throat	Geothlypis trichas occidentalis.
Long-tailed chat	Icteria virens longicauda.
Golden pileolated warbler	Wilsonia pusilla chryseola.
English warbler	Passer domesticus domesticus.
Western meadowlark	Sturnella neglecta neglecta.
Yellow-headed blackbird	Xanthocephalus xanthocephalus.
Nevada red-wing	Agelaius phoeniceus nevadensis.
Tricolored red-wing	Agelaius tricolor.
Bullock's oriole	Icterus bullocki bullocki.
Brewster's blackbird	Euphagus cyanocephalus.
Nevada cowbird	Molothrus ater artemisiae.
Western tanager	Piranga ludoviciana.
Black-headed grosbeak	Hedymeles melanocephalus capitalis.
Lazuli bunting	Passerina amoena.
Western evening grosbeak	Hesperiphona vespertina brooksi.
California purple finch	Carpodacus purpureus californicus.
Cassin's purple finch	Carpodacus cassini.
Common house finch	Carpodacus mexicanus frontalis.
Alaska pine grosbeak	Pinicola enucleator alascensis.
Northern pine siskin	Spinus pinus pinus.
Pale goldfinch	Spinus tristis pallidus.
Bendire's crossbill	Loxia curvirostra bendirei.
Green-tailed towhee	Oberholseria chlorura.
Nevada towhee	Pipilo maculatus curtatus.
Western Savannah sparrow	Passerculus sandwichensis alaudinus.
Nevada Savannah sparrow	Passerculus sandwichensis nevadensis.
Western vesper sparrow	Pooecetes gramineus confinis.
Western lark sparrow	Chondestes grammacus strigatus.
Northern sage sparrow	Amphispiza nevadensis nevadensis.
Slate-colored junco	Junco hyemalis hyemalis.
Thurber's junco	Junco oreganus thurberi.
Western chipping sparrow	Spizella passerina arizonae.
Brewer's sparrow	Spizella breweri breweri.
Gambel's sparrow	Zonotrichia leucophrys gambeli.
Golden-crowned sparrow	Zonotrichia coronata.
Warner Mountains fox sparrow	Passerella iliaca fulva.
Modoc song sparrow	Melospiza melodia fisherella.

LIST OF MAMMALS

Oregon bison (extinct)	Bison bison oregonus.
Rimrock bighorn (extinct)	Ovis canadensis californiana.
Prong-horned antelope	Antilocapra americana oregona.
Roosevelt's elk (introduced)	Cervus canadensis roosevelti.
Rocky Mountain mule deer	Odocoileus hemionus macrotis.
Columbian black-tailed deer	Odocoileus hemionus columbianus.
Oregon snowshoe hare	Lepus americanus klamathensis.
Oregon jack rabbit	Lepus californicus wallawalla.
Oregon cottontail	Sylvilagus nuttallii nuttallii.
Silver gray squirrel	Sciurus griseus griseus.
Sierra squirrel	Sciurus douglasii albolimbatus.
Allen's chipmunk	Eutamias townsendii senex.
Klamath chipmunk	Eutamias amoenus amoenus.
Sagebrush chipmunk	Eutamias minimus pictus.
Golden-mantled ground squirrel	Citellus lateralis chrysodeirus.
Douglas's ground squirrel	Citellus beecheyi douglasii.
Oregon ground squirrel	Citellus beldingi oregonus.
Yellow-bellied marmot	Marmota flaviventris flaviventris.
Klamath flying squirrel	Glaucomys sabrinus klamathensis.
House mouse	Mus musculus musculus.
Western bushy-tailed woodrat	Neotoma cinerea occidentalis.
Oregon grasshopper mouse	Onychomys leucogaster fuscogriseus.
Gambel's deer mouse	Peromyscus maniculatus gambelii.
Desert harvest mouse	Reithrodontomys megalotis megalotis.
Peale's meadow mouse	Microtus montanus montanus.
Rocky Mountain meadow mouse	Microtus longicaudus mordax.
Muskrat (introduced)	Fiber zibethicus (subsp.?)
Shasta beaver	Castor canadensis shastensis.
Brown mountain beaver	Aplodontia rufa rufa.
Yellow-haired porcupine	Erethizon epixanthum epixanthum.
Northern California kangaroo rat	Dipodomys heermanni californicus.
Coues's pocket mouse	Perognathus parvus mollipilosus.
White-toothed pocket gopher	Thomomys bottae leucodon.
Dalles pocket gopher	Thomomys talpoides quadratus.
Oregon cougar	Felis concolor oregonensis.
Cascade bobcat	Lynx rufus pallescens.
Mountain coyote	Canis latrans lestes.
Cascade red fox	Vulpes fulvus cascadensis.
Oregon gray fox	Urocyon cinereoargenteus townsendi.
Mountain weasel	Mustela frenata arizonensis.
Western mink	Mustela vison energumenos.
Western otter	Lutra canadensis pacifica.
California badger	Taxidea taxus neglecta.
Great Basin skunk	Mephitis occidentalis major.
Great Basin spotted skunk	Spilogale gracilis saxatilis.
Northwestern raccoon	Procyon lotor pacifica.

Ring-tailed cat	Bassariscus astutus raptor.
Black bear (extirpated)	Euarctos americanus (subsp.?).
Klamath grizzly bear (extinct)	Ursus klamathensis.
Klamath mole	Scapanus latimanus dilatus.
Gibb's mole	Neurotrichus gibbsii gibbsii.
Rocky Mountain water shrew	Sorex palustris navigator.
Bendire's shrew	Sorex bendirii bendirii.
Yosemite shrew	Sorex trowbridgii mariposae.
Sierra shrew	Sorex vagrans amoenus.
Merriam's shrew	Sorex merriami.
Tejon bat	Myotis yumanensis sociabilis.
Yellowstone bat	Myotis lucifugus carissima.
Silver-haired bat	Lasionycteris noctivagans.
Intermediate jack-rabbit bat	Corynorhinus rafinesquii intermedius.
Pacific pallid bat	Antrozous pallidus pacificus.

HOW TO REACH THE REFUGES

The Klamath Basin may easily be reached both by train and by automobile. The city of Klamath Falls, on the main line of the Southern Pacific Railroad between Portland, Oreg., and Los Angeles, Calif., has excellent hotel accommodations, and a good system of roads leads to all four of the wildlife refuges. The area is also accessible by U. S. Highway 97, which passes through Klamath Falls, coming from Crater Lake National Park, Oreg., to the north and from Weed, Calif., to the south. Those using the Pacific Highway (U S 99) should turn east on State Highway 66 at Ashland, Oreg., for a distance of 64 miles direct to Klamath Falls, or northeast on U. S. Highway 97 at Weed. From the east the Basin is reached by State Highway 66 from Lakeview, Oreg., and from the southeast by State Highway 39 from Alturas and Canby, Calif., on U. S. Highway 299.

INFORMATION ON OTHER REFUGES

National wildlife refuges administered by the Fish and Wildlife Service. Compiled in the Division of Wildlife Refuges. Fish and Wildlife Service Wildlife Leaflet 179, 8 p. March 1941. Revised, March 1942. (Processed.) (Obtainable from the Fish and Wildlife Service, Chicago, Ill.)

Preserves and ranges maintained for buffalo and other big game. By Clara Ruth, Assistant, Section of Big-Game Refuges and Game Agents, Division of Game Management. Bureau of Biological Survey Wildlife Research and Management Leaflet BS-95, 26 p., illus. September 1937. (Processed.) (Out of print; may be consulted in libraries.)

Research in the administration of Federal refuges. By E. R. Kalmbach, Biologist, Section of Food Habits, Division of Wildlife Research. Bureau of Biological Survey Wildlife Leaflet BS-164, 7 p. June 1940. (Processed.) (Obtainable from the Fish and Wildlife Service, Chicago, Ill.)

Fort Niobrara Game Preserve, Nebraska. By Clara Ruth, Assistant, Division of Wildlife Refuges. Bureau of Biological Survey Wildlife Research and Management Leaflet BS-109, 9 p. April 1938. (Processed.) (Obtainable from the Fish and Wildlife Service, Chicago, Ill.)

Hart Mountain Antelope Refuge. By Stanley G. Jewett, Biologist, Division of Wildlife Refuges. U. S. Department of Agriculture Miscellaneous Publication 355, 25 p., illus. June 1939. 10¢. (Obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C.)

Lake Mattamuskeet Wildlife Refuge. Prepared in the Division of Wildlife Refuges. Bureau of Biological Survey Wildlife Leaflet BS-146, 2 p. October 1939. (Processed.) (Out of print; may be consulted in libraries.)

Sullys Hill National Game Preserve, North Dakota. Prepared in the Division of Wildlife Refuges. Bureau of Biological Survey Wildlife Leaflet BS-157, 6 ps., illus. April 1940. (Processed.) (Obtainable from the Fish and Wildlife Service, Chicago, Ill.)